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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/785,342

02/24/2004

Grant B. Carlson

CA2-1

8743

20808

7590

01/25/2006

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EXAMINER

BOTTORFF, CHRISTOPHER

ART UNIT

PAPER NUMBER

3618

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/785,342	CARLSON, GRANT B.	
	Examiner	Art Unit	
	Christopher Bottorff	3618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 13-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/24/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

The amendment filed December 20, 2005 has been entered. Claims 1-22 are pending.

#### ***Election/Restrictions***

Applicant's election of invention I, directed to claims 1-12, in the reply filed on December 20, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 13-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

#### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on February 24, 2004 was considered by the examiner.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 8-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation “(traction battery)” on line 3, which renders the scope of the claim as unclear. The claimed electricity storage device may be limited to a traction battery only, or the traction battery may only be an example of one type of electricity storage device that is expressed parenthetically. For the purposes of examination, claim 2 has been interpreted as if “(traction battery)” were deleted and the claim encompassed a wide range of electricity storage devices.

Claim 8 states that “the driveshaft includes a rotor” on lines 4 and 5, which suggests that the rotor is a component of the driveshaft. However, the disclosure suggests that the driveshaft and rotor are distinct components with the rotor being fixed to the driveshaft. In particular, page 8, line 30, through page 9, line 4, and Figure 2 disclose that the rotor windings 85 are placed in the driveshaft 35, which presents the rotor windings and driveshaft as two separate components. For the purposes of examination, the limitation “the driveshaft includes a rotor” has been interpreted such that the rotor is a distinct component from the driveshaft and the rotor is fixed to the driveshaft.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boll et al. US 6,868,927 alone.

Boll et al. disclose a hybrid vehicle that is traction powered by an internal combustion engine 2 and an electric motor 3 powered by a fuel cell system 8. See the Figure and column 3, lines 21-23 and 54-56. The hybrid vehicle's drive system comprises the electric motor 3 combined with a driveshaft that is also driven by the internal combustion engine 2 via a transmission 4. See the Figure. Values of power delivered to the electric motor 3 from the fuel cell system 8 are established to rotate the driveshaft independently or in combination with the internal combustion engine 2, depending on vehicle traction drive demands. See column 4, lines 64-67, and column 5, lines 1-5 and 20-33.

The same fuel powers the internal combustion engine 2 and the fuel cell system 8. See column 4, lines 12-17. Also, exhaust from the internal combustion engine 2 provides heat to the fuel cell 8. See column 4, lines 49-51.

Boll et al. do not disclose that a computer controller establishes the values of power delivered to the electric motor from the fuel cell system. However, the examiner takes official notice that the desirability of utilizing a computer controller to establish power delivery values in a vehicle drive system was known to those of ordinary skill in the art at the time the invention was made. Utilizing a computer controller to establish power delivery values in the system of Boll et al. would have been obvious to one of

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ordinary skill in the art at the time the invention was made. This would utilize a reliable and effective control means that could help achieve operational efficiency in the system.

Claims 2 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boll et al. US 6,868,927 in view of Botti et al. US 6,655,325.

Boll et al. do not disclose that the fuel cell system delivers both peak and mean power to the electric motor without the need of an electric storage device, that the exhaust of fuel cell system is fed back into an intake of the internal combustion engine, or that the fuel cell system includes a Solid Oxide Fuel Cell (SOFC).

However, since the fuel cell system of Botti et al. delivers power at all power levels to a motor without the need of an electric storage device, Botti et al. teaches the desirability of arranging a fuel cell system to deliver both peak and mean power to an electric motor without the need of an electric storage device. See column 2, line 39, through column 3, line 37, and column 5, lines 25-27. Botti et al. further teach the desirability of providing a fuel cell system with a SOFC. See column 2, lines 28-29; column 3, lines 58-59; and column 4, lines 1-19. Botti et al. also teaches the desirability of feeding the exhaust of a fuel cell system back into an intake of an internal combustion engine. See column 3, lines 28-32.

From the teachings of Botti et al., utilizing the fuel cell system of Boll et al. to deliver both peak and mean power to an electric motor without the need of an electric storage device would have been obvious to one of ordinary skill in the art at the time the invention was made. This would reduce or eliminate the need to use the battery,

thereby reducing wear in the battery. From the further teachings of Botti et al., providing the fuel cell system of Boll et al. with a SOFC would have been obvious to one of ordinary skill in the art at the time the invention was made. This would effectively ionize oxygen in the system and produce efficient direct current electricity. From the teachings of Botti et al., feeding the exhaust of the fuel cell system of Boll et al. back into an intake of the internal combustion engine would have been obvious to one of ordinary skill in the art at the time the invention was made. This would help to increase the efficiency of combustion in the engine and reduce harmful emissions.

Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boll et al. US 6,868,927 in view of Botti et al. US 6,655,325 as applied to claims 2 and 4-6 above, and further in view of Bowen US 6,719,656.

Although the Figure of Boll et al. depicts the motor 3 disposed around the driveshaft, Boll et al. do not disclose that the rotor of the motor is coaxial with the driveshaft such that the rotor is fixed to the driveshaft and the stator, which is fixed to the vehicle, surrounds the rotor.

However, Bowen teaches the desirability of arranging the rotor 72 of a motor around a driveshaft 54 such that the rotor 72 is coaxial with and fixed to the driveshaft 54. See Figures 2 and 3; column 3, lines 63-65; and column 4, lines 33-46. The stator 70, which is fixed to the vehicle, surrounds the rotor 72. See Figure 2 and column 3, lines 63-65. From the teachings of Bowen, arranging the motor of Boll et al. such that a rotor is coaxial with and fixed to the driveshaft and the stator surrounds the rotor and is

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fixed to the vehicle would have been obvious to one of ordinary skill in the art at the time the invention was made. This would allow the motor to directly rotate the drive shaft without the need for intermediate components like gears, thereby providing efficient torque transmission between the motor and driveshaft.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kubo, Lyons, Frank, Rosen et al., Greenhill et al., Bowen et al. US 6,604,591, Botti et al. US 6,609,582, Iwasaki, and Takashima et al. disclose hybrid vehicle arrangements.

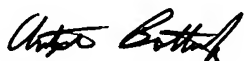
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Bottorff whose telephone number is (571) 272-6692. The examiner can normally be reached on Mon.-Fri. 7:30 a.m. - 4:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Ellis can be reached on (571) 272-6914. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Christopher Bottorff".

Christopher Bottorff